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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/584,337
Filing Date: June 23, 2006
Appellant(s): SCHUSTER ET AL.

Clifford A. Ulrich
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/02/2010 appealing from the Office action mailed 4/29/2010.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,078,203	Zafarana et al.	6-2000
3,714,470	Goldberg	1-1973
AAPA	Admitted Prior Art	3-2007

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8-10, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Zafarana et al (USP 6,078,203).

Regarding claim 8: AAPA (**For example: see Specification, lines 5-13 of page**

- 1) discloses a converter comprising: a device (**current sensing means**) adapted to sense currents fed to an electric motor powered by the converter, the device arranged

inside the converter, an additional filter that is connected to an analog-to-digital converter **(paragraph [0008], FIG 1 and FIG 2 show the same microcontroller 2 which comprises the analog-to-digital converter).**

AAPA does not disclose a nonlinear filter and output signals of nonlinear filter are fed to an additional filter. Zafarana et al **(For example: see FIG 3)** teaches the output signals of a nonlinear filter **(7)** are fed to a linear filter **(2)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify converter in the motor control system of AAPA to include the nonlinear filter by Zafarana et al, for the purpose of controlling gain of the transmitted signals within desired values **(Zafarana et al, Abstract).**

Additionally, since AAPA and Zafarana et al are both from the same field of endeavor **(power control system)**, the purpose disclosed by Zafarana et al would have been recognized in the pertinent art of AAPA.

Regarding claim 9: AAPA **(For example: see FIG 1)** discloses the analog-to-digital converter **(page 2, lines 28-31)** is integrated in one of (a) a microcontroller and (b) a microprocessor **(2) (item 2 of FIG 1 and item 2 of FIG 2 are not different because they are labeled the same; applicant argued on page 3 of Applicant Arguments/Remarks that a microprocessor can include an integrated analog to digital converter; it is also well known in the art to have analog to digital converter included in microprocessor).**

Regarding claim 10: AAPA fails to disclose the nonlinear filter includes a run-up transmitter. Zafarana et al (**For example: see FIG 1**) teaches the nonlinear filter includes a run-up transmitter (**integrator 8; transmitter is a device for transmitting signals, integrator 8 has input error signal ERR and output signal ERRm therefore it is considered as a device for transmitting signals**) (*same reason for combination as in claim 8*).

Regarding claim 12: AAPA (**For example: see Specification, lines 5-13 of page 1**) discloses the additional filter includes a low-pass filter.

Regarding claim 13: AAPA in view of Zafarana et al discloses the claimed invention except for a value corresponding to a rated current of the converter is attainable for the run-up transmitter in a time between 5 and 10 μ s. It would have been obvious to one having ordinary skill in the art at the time the invention was made to achieve a value corresponding to a rated current of the converter for the run-up transmitter in a time between 5 and 10 μ s, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 14: AAPA in view of Zafarana et al discloses the claimed invention except for the PT1 filter has a time constant having a value one of (a) between 15 and 25 μ s and (b) approximately 20 μ s. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the PT1 filter with a time constant having a value one of (a) between 15 and 25 μ s and (b) approximately 20 μ s, since it has been held that where the general conditions of a claim are disclosed in

the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. It has also been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Zafarana et al (USP 6,078,203) and further in view of Goldberg (USP 3,714,470).

Regarding claim 11: AAPA in view of Zafarana et al discloses claimed invention except for the run-up transmitter including a comparator and an integrator. Goldberg **(For example: see FIG 1)** teaches the run-up transmitter **(Variable Duty Cycle Signal Generator)** including a comparator **(16)** and an integrator **(14)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the motor control system of AAPA to include the run-up transmitter including a comparator and an integrator of Goldberg for the purpose of maintaining linear change of output signal in triangular shape **(Goldberg, Abstract)**.

Additionally, since AAPA, Zafarana et al, and Goldberg are all from the same field of endeavor **(power control system)**, the purpose disclosed by Goldberg would have been recognized in the pertinent art of AAPA and Zafarana et al.

(10) Response to Argument

1) Appellant's arguments regarding claim 8 rejection under 35 U.S.C. 103(a):

a) Appellant's argument from line 10-32 of page 4 copied below:

Zafarana does not overcome the critical deficiencies noted above with respect to the AAPA. Zafarana discloses a non-linear voltage regulator for an automotive alternator. Zafarana is cited in the Final Office Action for the disclosure in Figure 3 of providing output signals from a nonlinear filter to a linear filter. However, Zafarana lacks any disclosure relating to an electric motor powered by the presently claimed converter that includes a device adapted to sense currents fed to the electric motor. Rather, Zafarana discloses a voltage regulator, which has a linear filter, a comparator, and a stretcher filter, connected in cascade with one another between an input terminal and an output terminal of the regulator. The input terminal receives an error signal converted by the comparator into a square-wave error signal, and the output terminal delivers a square-wave output control signal, having a stretched duty cycle over the square-wave error signal by a time delay introduced from the stretcher filter. See Zafarana, column 3, lines 14 to 24. As cited in the Final Office Action, Figure 3 of Zafarana discloses a voltage regulator 1. At column 3, lines 35 to 43, Zafarana discloses:

The regulator 1 comprises a linear filter 2, specifically of the low-pass type, a comparator 3, and a stretcher filter 4, which are connected, in cascade with one another, between an input terminal I1 and an output terminal O1 of the regulator 1.

In particular, the linear filter 2 has an input terminal I2 connected to the input terminal I1 of the regulator 1, and an output terminal O2 connected to an input terminal I3 of the comparator 3. The latter has an output terminal O3 connected to an input terminal I4 of the stretcher filter 4. The stretcher filter 4 has an output terminal O4 connected to the output terminal O1 of the regulator 1. One of ordinary skill in the art would understand from Figure 3 that the input terminal I2 of the linear filter 2 receives signals from the non-linear filter of the non-linear filtering section 5 of the regulator 1.

Examiner's Response:

Appellant acknowledges that Figure 3 of Zafarana discloses output signals from a nonlinear filter are fed to a linear filter in an automotive alternator. Appellant does not disagree that AAPA discloses an electric motor powered by a converter that has a device adapted to sense currents fed to electric motor. It is well known in the art that alternator is a device to generate AC current and it can be converted into a motor, it is also well known in the art that motor is used as AC current generator. Zafarana's automotive alternator discloses the electric motor in claim 8.

FIG 3 of Zafarana shows the direction of arrow from non-linear filter 7 to linear filter 2, the direction of arrow from linear filter 2 to comparator 3, and the direction of arrow from comparator 3 to stretcher filter 4, those arrow directions and lines 1-3 of col. 5 of Zafarana demonstrate that the circuitry is open and it does not have any feedback from output O1 to non-linear filter thus it is impossible to have a backward effect from the stretcher filter 4, the comparator 3, the linear filter 2, to the non-linear filter 7 if comparator and stretcher filter are removed. If one having ordinary skill in the art is interested in using the output of the linear filter, he/she is motivated to remove the comparator, the stretcher filter, the frequency reader, and the frequency controller because those elements are for suppressing spurious switchings to reduce the switching frequency of the linear filter/stretcher filter/comparator system only (lines 65-67 of col. 1). Therefore one having ordinary skill in the art can modify Zafarana's voltage regulator to combine it with AAPA in order to disclose the arrangement presently claimed in claim 8.

b) Appellant's argument from line 1 of page 5 to line 9 of page 6 copied below:

Zafarana clearly discloses that the linear filter, comparator, and stretcher filter are connected in cascade with one another. One of ordinary skill in the art following the disclosure of Zafarana would understand that the output from a linear filter should be supplied to a comparator, and the output of the comparator should then be supplied to a stretcher filter. That is not the arrangement presently claimed. Rather, one of ordinary skill in the art following the disclosure of Zafarana would not connect the output of the disclosed linear filter 2 to an analog-to-digital converter. Thus, even if one of ordinary skill in the art combined the disclosure of Zafarana with the AAPA, the resulting combination would not provide the presently claimed converter.

Nonetheless, the Final Office Action at page 8 asserts that "[o]ne of ordinary skill in the art should know to exclude the comparator and stretcher filter." However, as described above, Zafarana merely describes a linear filter, comparator, and stretcher filter that are intended to be cascaded together. In this regard, Zafarana describes at column 1, lines 35 to 54, and 65 to 67

that a linear filter alone is not sufficient to filter out a noise signal. Thus, a comparator is needed to produce a square wave, and a stretcher filter is further required to suppress spurious comparator switchings. Moreover, in order to completely remove spurious comparator switchings, Zafarana provides a non-linear filtering section. See Zafarana, column 5, lines 25 to 29. Thus, according to Zafarana, the non-linear filtering section is effective only because it is used in combination with the linear filter, comparator, and stretcher filter cascaded together. Accordingly, contrary to the assertions of the Final Office Action, one of ordinary skill in the art would not be motivated to exclude the comparator and stretcher filter as described by Zafarana, since those elements are essential to the proper function of the device of Zafarana.

Further, the Advisory Action asserts the following:

One of ordinary skill in the art following the disclosure of Zafarana in light of AAPA should easily recognize that to convert the output of the linear filter into digital signal, it is required to connect the output of the linear filter to an analog to digital converter [sic] instead of a comparator. Assuming that one of ordinary skill in the art would understand to use an analog to digital converter to convert the output to a digital signal, which is not necessarily conceded by Applicants, it is respectfully submitted that one of ordinary skill in the art "following the disclosure of Zafarana," as stated in the Advisory Action, would not connect the output of the linear filter to an analog to digital converter "instead of a comparator." In this regard, as set forth above, Zafarana teaches that "[p]rior approaches ... at reducing the amplitude of the noise signal by filtering ... through a linear filter ... [has] never [been] fully successful in filtering out the noise signal." See Zafarana, column 1, lines 35 to 43. Thus, Zafarana teaches the use of a comparator and a stretcher filter in combination with a linear filter in order to further filter the noise signal. See Zafarana, column 1, lines 45 to 54, and 65 to 67. Therefore, it is respectfully submitted that one of ordinary skill in the art "following the disclosure of Zafarana" would not connect the output of the linear filter to an analog to digital converter instead of a comparator because such a modification of Zafarana would eliminate the benefits of the inclusion of a comparator and a stretcher filter specifically disclosed by Zafarana. In short, such a modification of Zafarana is in direct opposition to the disclosure of Zafarana.

Examiner's Response:

Zafarana (lines 65-67 of col. 1) discloses that the linear filter, comparator, and stretcher filter are for suppressing spurious switchings to reduce the switching frequency of the linear filter/stretcher filter/comparator system, they do not have any effect on the output from the non-linear filter to the linear filter. FIG 3 of Zafarana shows the direction of arrow from non-linear filter 7 to linear filter 2, the direction of arrow from linear filter 2 to comparator 3, and the direction of arrow from comparator 3 to stretcher filter 4, those arrow directions and lines 1-3 of col. 5 of Zafarana demonstrate that the circuitry is open and it does not have any feedback from output O1 to non-linear filter thus it is impossible to have a backward effect from the stretcher filter

4, the comparator 3, the linear filter 2, to the non-linear filter 7 if comparator and stretcher filter are removed Zafarana discloses in lines 33-36 of col. 4 ***"Thus, according to the invention, the non-linear-filter 7 provided is advantageous in that it reduces the noise amplitude at the input terminal I2 of the linear filter 2, irrespective of the alternator load and the engine rpm."*** Thus, one of ordinary skill in the art definitely applies this advantage to combine the disclosure of Zafarana with the AAPA, the resulting combination would provide the presently claimed converter because the non-linear filter reduces the noise amplitude at the input terminal of the linear filter. In addition, one of ordinary skill in the art should know to exclude the comparator and stretcher filter of Zafarana because they do not serve the purpose of converting analog signal into digital signal, one of ordinary skill in the art should know to exclude the comparator and stretcher filter of Zafarana when he/she does not have interest in reducing the switching frequency of the linear filter/stretcher filter/comparator system. As analyzed above, the directions of the arrows suggest to one having ordinary skill in the art that no operational problem would happen if the comparator, the stretcher filter, and the rest of circuitry connected to the output of the stretcher filter are detached from the linear filter in order to feed the output of the linear filter to an analog-to-digital converter. Analog-to-digital converter is well known in the art, it would have been obvious to one having ordinary skill in the art to make necessary adjustment to feed the output of the linear filter to an analog-to-digital converter because analog-to-digital converter would convert the analog output of the linear filter into digital signal.

Comparator, stretcher filter, frequency reader, and frequency controller of Zafarana are not required to reduce the noise amplitude at the input terminal of the linear filter and to convert the analog output of the linear filter into digital signal. Therefore one having ordinary skill in the art would be motivated to detach those elements and keep only the non-linear filter and the linear filter which are essential to the proper function of the device disclosed in claim 1. One having ordinary skill in the art would follow the disclosure of Zafarana using the non-linear filter to reduce the noise amplitude at the input terminal of the linear filter then detach all the elements on the output side of the linear filter to feed the output of the linear filter to analog-to-digital converter disclosed by AAPA.

Contrary to appellant's argument, the working combination of AAPA and Zafarana discloses the arrangement presently claimed in lines 4-5 of claim 8:

"output signals of the nonlinear filter fed to an additional filter that is connected to an analog-to-digital converter".

c) Appellant's argument from line 11-32 of page 6 copied below:

Moreover, the Advisory Action asserts the following:

It is noted that the combination of AAPA and Zafarana emphasizes only on the usage and function of the nonlinear filter and the linear filter not the function of the whole device of Zafarana.

However, it is respectfully submitted that "the usage and function of the nonlinear filter and the linear filter" described by Zafarana is dependent upon "the function of the whole device of Zafarana." As more fully set forth above, Zafarana states that the use of a linear filter alone is insufficient and therefore describes the use of a comparator and stretcher filter in combination with the linear filter. Furthermore, Zafarana describes that a nonlinear filter may be provided to remove spurious switchings of the comparator and stretcher filter. See Zafarana, column 5, lines 25 to 29. Thus, the inclusion of a nonlinear filter in Zafarana is dependent upon the inclusion of a comparator and stretcher filter. Accordingly, if the comparator and stretcher filter of Zafarana are removed, then there is also no need to include a nonlinear filter. Therefore, contrary to the assertions of the Advisory Action, it is respectfully submitted that one of ordinary skill in the art following the disclosure of Zafarana would not be motivated to utilize only the nonlinear filter and linear filter of Zafarana because Zafarana does not disclose any benefits of such a combination, absent the additional inclusion of a comparator and stretcher filter, i.e., the whole device of Zafarana.

Accordingly, it is respectfully submitted that the combination of the AAPA and Zafarana does not disclose, or even suggest, all of the features included in claim 8. Therefore, it is respectfully submitted that the combination of the AAPA and Zafarana does not render unpatentable the presently pending claims for at least the foregoing reasons.

Examiner's Response:

Zafarana discloses in lines 33-36 of col. 4 ***"Thus, according to the invention, the non-linear-filter 7 provided is advantageous in that it reduces the noise amplitude at the input terminal I2 of the linear filter 2, irrespective of the alternator load and the engine rpm."*** Thus, one of ordinary skill in the art definitely applies this advantage to combine the disclosure of Zafarana with the AAPA, the resulting combination would provide the presently claimed converter because the non-linear filter reduces the noise amplitude at the input terminal of the linear filter.

Zafarana (lines 65-67 of col. 1) discloses that the linear filter, comparator, and stretcher filter are for suppressing spurious switchings to reduce the switching frequency of the linear filter/stretcher filter/comparator system, they do not have any effect on the output from the non-linear filter to the linear filter. It is understood that "the usage and function of the nonlinear filter and the linear filter" described by Zafarana is dependent upon "the function of the whole device of Zafarana." because FIG 3 of Zafarana shows the direction of arrow from non-linear filter 7 to linear filter 2, the direction of arrow from linear filter 2 to comparator 3, and the direction of arrow from comparator 3 to stretcher filter 4, those arrow directions and lines 1-3 of col. 5 of Zafarana demonstrate that the circuitry is open and it does not have any feedback from output O1 to non-linear filter thus it is impossible to have a backward effect from the stretcher filter 4, the comparator 3, the linear filter 2, to the non-linear filter 7 if

comparator and stretcher filter are removed. One having ordinary skill in the art would detach all the elements on the output side of the linear filter to feed the output of the linear filter to analog-to-digital converter disclosed by AAPA.

In conclusion, because of the reasons above it is understood that the combination of the AAPA and Zafarana disclose all of the features included in claim 8.

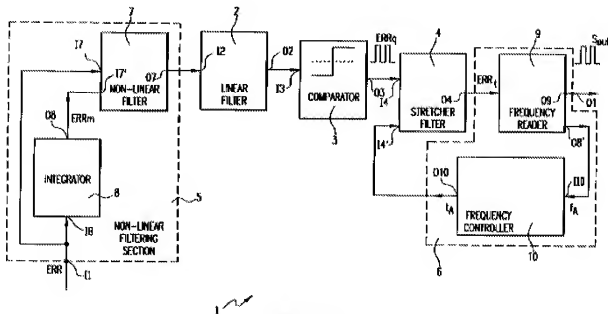


FIG. 3

- 2) Appellant's arguments regarding claims 9, 10, and 12-14 rejection under 35

U.S.C. 103(a):

Appellant's argument from line 33 of page 6 to line 2 of page 7 copied below:

As for claims 9, 10, and 12 to 14, which ultimately depend from claim 8 and therefore include all of the features included in claim 8, it is respectfully submitted that the combination of the AAPA and Zafarana does not render unpatentable these dependent claims for at least the reasons more fully set forth above in support of the patentability of claim 8.

Examiner's Response:

Claims 9, 10, and 12-14 are not allowed because they are anticipated by AAPA as presented in Grounds of Rejection and Examiner's Response to claim 8 above.

3) Appellant's arguments regarding claim 11 rejection under 35 U.S.C. 103(a):

Appellant's argument in lines 10-19 of page 7 copied below:

Claim 11 ultimately depends from claim 8. As more fully set forth above, the combination of the AAPA and Zafarana does not disclose, or even suggest, all of the features included in claim 8. Goldberg also does not disclose, or even suggest, all of the features included in claim 8, and thus, fails to cure this critical deficiency. In this regard, Goldberg is cited in the Final Office Action for the alleged disclosure of a run-up transmitter including a comparator and an integrator. However, even if one of ordinary skill in the art would combine the disclosure of Goldberg with the AAPA and Zafarana, the resulting combination would not provide the presently claimed converter. As such, it is respectfully submitted that the combination of the AAPA, Zafarana, and Goldberg does not render unpatentable claim 11.

Examiner's Response:

Claim 11 is not allowed because they are anticipated by AAPA as presented in Grounds of Rejection and Examiner's Response to claim 8 above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Emily Pham/

Examiner, Art Unit 2838

Conferees:

/Monica Lewis/ Supervisory Patent Examiner, Art Unit 2838

Jose' G Dees /Jose' G. Dees/ T-QAS TC 2800